

MONTE VISTA CHRISTIAN SCHOOL  
MATH 4352 AP Calculus BC  
Course Syllabus

Course Description:

A continuation of the concepts learned in AP Calculus AB. Methods of integration (including applications to physics, L'Hôpital's Rule, and improper integrals), infinite series, conics, parametric equations, polar coordinates, and vector value functions are presented with an emphasis on problem solving in "real world" situations.

Curricular Mapping:

This course will continue to develop student skills in problem solving and understanding mathematical concepts and methods. Solving complex problems involving reasoning, methods of integration, infinite series, and vector functions will build upon skills acquired in Algebra I, Geometry, Algebra II, Precalculus, and the first course of Calculus and prepare the student for further Calculus at the college level.

Course Objectives:

Upon the successful completion of this course the student will be able to:

1. Analyze and solve complex problems involving reasoning, methods of integration, infinite series, and vector functions, etc.
2. Use reasoning skills to analyze and prove conjectures involving postulates and theorems.
3. Understand, apply, manipulate, and create programs to execute repeated, large-scale computations using mathematical algorithms.
4. Through the AP test, satisfy a second semester of college calculus credit.

Text:

Course material will be available in the classroom.

Prerequisites:

AP Calculus AB

Course Outline:

1. Review of Chapters 1 through 5
2. Review of Chapter 6 Differential Equations
  - a. 6.1 Slope Fields and Euler's Method

- b. 6.2 Differential Equations: Growth and Decay
- c. 6.3 Separation of Variables and the Logistic Equation
- d. 6.4 First-Order Linear Differential Equations
- 3. Chapter 7 Applications of Integration
  - a. 7.1 Area of a Region Between Two Curves
  - b. 7.2 Volume: The Disk Method
  - c. 7.3 Volume: The Shell Method
  - d. 7.4 Arc Length and Surfaces of Revolution
- 4. Chapter 8 Integration Techniques, L'Hopital's Rule, and Improper Integrals
  - a. 8.1 Basic Integration Rules
  - b. 8.2 Integration by Parts
  - c. 8.3 Trigonometric Integrals
  - d. 8.4 Trigonometric Substitution
  - e. 8.5 Partial Fractions
  - f. 8.6 Integration by tables and Other Integration Techniques
  - g. 8.7 Indeterminate Forms and L'Hopital's Rule
  - h. 8.8 Improper Integrals
- 5. Chapter 9 Infinite Series
  - a. 9.1 Sequences
  - b. 9.2 Series and Convergence
  - c. 9.3 The Integral Test and  $p$ -Series
  - d. 9.4 Comparisons of Series
  - e. 9.5 Alternating Series
  - f. 9.6 The Ratio and Root Tests
  - g. 9.7 Taylor Polynomials and Approximations
  - h. 9.8 Power Series
  - i. 9.9 Representation of Functions by Power Series
  - j. 9.10 Taylor and Maclaurin Series
- 6. Conics, Parametric Equations, and Polar Coordinates
  - a. 10.1 Conics and Calculus
  - b. 10.2 Plane, Curves, and Parametric Equations
  - c. 10.3 Parametric Equations and Calculus
  - d. 10.4 Polar Coordinates and Polar Graphs
  - e. 10.5 Area and Arc Length in Polar Coordinates
  - f. 10.6 Polar Equations of Conics and Kepler's Laws

Grading:

<u>Grade Book Categories</u>		<u>Semester Weighted Grading Configuration</u>	
Homework	15%	Quarter	40%
Quizzes/Projects	35%	Quarter	40%
Tests	50%	Final Exam	20%

Explanation of Grade Book Categories:

All student quarter grades will be weighted as follows:

1. Homework 15%: Homework is where the greatest amount of learning takes place. It is imperative that every homework assignment be completed in full. Late homework will not be accepted. Students can expect an average of 45 minutes of homework each day.
2. Quizzes 35%: Quizzes is where you are held accountable for your ongoing learning. We will have a quiz every week and it will cover the material from each week's homework.
3. Tests 50%: The tests will be cumulative and will model what will be asked on the AP exam.

Make-Up Work

School policy does not allow make up of missed assignments/tests when absences are unexcused. Students with excused absences will be allowed the number of days absent to complete all work for full credit. Work due on the first day of absence is due the day the student returns to class. A student absent on the day of a test must be prepared to take the test upon his/her return. It is the responsibility of the student to show their homework to the instructor upon return.

High School Standard Grading Policy:

Please refer to the policy and procedures posted online in our Parent-Student Handbook.

Class policies:

Please see the instructor if you have any concerns with your ability to follow these policies.

1. Tardiness: Class starts at the bell. Students are expected to have their pencils sharpened, have all required materials out on their desk, and be seated and ready for class when the bell rings.
2. Absences: Making up homework and tests is the responsibility of the student. Students absent the day before a test are required to take the test with the rest of the class. The policies set forth in the Parent-Student Handbook will be followed regarding make-up work for any excused absence. It is critical that each student find out what has been missed as soon as possible and plan accordingly.

3. Integrity: It is the responsibility of each student to establish and maintain integrity with each assignment and assessment. Collaboration is encouraged with homework and projects, but it is critical that students' seek to understand every part of these assignments. Any student not following the policies set forth for a particular assessment will receive no credit for that assessment.
4. Late work: Adhere to all deadlines. Late work will not be accepted.

#### School Policies and Expected Student Learning Results (ESLRs):

Students are subject to all academic policies of the school as found in the Parent-Student Handbook. Furthermore, it is each student's responsibility to read and follow all academic policies of Monte Vista Christian School. In addition to addressing each ESLR every year, we target a specific ESLR each academic year for particular focus

#### Testing Policy:

1. Being absent one day before a test does not excuse you from taking that test along with the rest of your class.
2. Calculators may not be shared on the day of a test.
3. If you are absent the day of a test, you will be expected to make up that test on the day you return to class.
4. Work must be shown in order to receive full credit.
5. This testing policy also applies to quizzes.
6. Should a student be truant or suspended on a quiz or test day, that student will be allowed to take the quiz or test and receive up to a maximum grade of 59%.

#### Tips for the Students:

The bulk of the learning takes place through the homework. Commitment to understanding each homework problem assigned is necessary to have a solid understanding of the content of this course.

#### Required Materials:

1. Graphing calculator approved by the College Board for AP testing (link below).  
<https://apstudent.collegeboard.org/apcourse/ap-calculus-bc/calculator-policy>  
(TI-84+ or TI-nspire calculators are recommended.)
2. Bring your calculus binder, pencils, red or blue pen, graphing calculator, and lined paper to class each day.

